

A NEW COMBINATION IN *DENDROCALAMUS*  
(POACEAE: BAMBUSOIDEAE)

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ABSTRACT

A new combination, *Dendrocalamus stocksii* (Munro) M. Kumar, Remesh & Unnikrishnan, is proposed to accommodate a widely occurring economically important bamboo in South and central India which was formerly described under *Oxytenanthera* Munro and *Pseudoxytenanthera* Soderstr. & R.P. Ellis.

RESUMEN

Se propone una nueva combinación, *Dendrocalamus stocksii* (Munro) M. Kumar, Remesh & Unnikrishnan, para acomodar un bambú de amplia distribución e importante económicamente del sur y centro de la India que fue descrito anteriormente en *Oxytenanthera* Munro y *Pseudoxytenanthera* Soderstr. & R.P. Ellis.

INTRODUCTION

During revisionary studies on some Indian bamboos, the authors undertook a detailed study on the delimitation of *Dendrocalamus* Nees, *Oxytenanthera* Munro, and *Pseudoxytenanthera* Soderstr. & R.P. Ellis. All of the species described in the above genera were critically examined using the specimens deposited in various herbaria including the type specimens. Field examination of the Indian species belonging to these genera was carried out. We found that *O. stocksii* Munro showed more affinity to the Genus *Dendrocalamus* in the vegetative and floral characters.

*Oxytenanthera stocksii* was first described by Munro (1868) based on the specimen collected by Stocks from the Concan area. This species is distributed in South India, along the Konkan coast up to Karwar. Subsequently, Talbot also collected it from the Coompta River in 1884 and Karwar in 1889. Munro's species was recognized by many later workers, e.g., Beddome (1873), Gamble (1896), Camus (1913), etc. It was, however, Holttum (1956) who asserted that the genus *Oxytenanthera* was truly represented by the African species *O. abyssinica* due to the peculiar nature of its ovary i.e. the ovary attenuate upwards very gradually into a more or less three angled hollow structure which bears the stigmas at its apex and the cavity of the style appears not to be continuous with the cavity which contains the ovule. He concluded that the rest of species described

within this genus should be transferred to some other genera. Based on this analysis, Majumdar (1989) transferred this species to a new genus, *Pseudotenanthera* Majumdar. Unfortunately, *Pseudotenanthera* is nom. superfl. and illegitimate for *Pseudoxytenanthera* Soderstr. & Ellis (1988). Nguyen (1990) treated this taxon under the genus *Gigantochloa* but it could not be included under this genus due to the presence of stamens with free filaments. Therefore, Naithani (1991) transferred this species to *Pseudoxytenanthera* as *P. stocksii* (Munro) Naithani. *Pseudoxytenanthera* is characterized by the presence of straggling culms, inflorescence with spikelets of semiverticillate clusters, monadelphous stamens, and three plumose stigmas. *Pseudoxytenanthera stocksii* possesses erect culms, free stamens, and a single plumose style. Although the previous authors described this species with fused filaments, during the present study, it was observed that the anther filaments are short and do not show true monadelphous condition. A close examination from the young stamens to mature stamens revealed that the filaments are totally free. Owing to these characteristic features, it cannot be accommodated within the genus *Oxytenanthera* Munro either. *Oxytenanthera stocksii* differs from *O. abyssinica*, the type species, by having free stamens and monostigmatic ovary. In *O. abyssinica* the stamens are monadelphous and the style is divided into three stigmas.

The culms and branching patterns of *Oxytenanthera stocksii* also resemble those of species of *Dendrocalamus* Nees. As in the case of the type species (i.e., *D. strictus*), *O. stocksii* shows erect culms with short internodes, which have narrow lumen (solid). The inflorescence of *O. stocksii* is a large panicle of spikeate heads. Even in *Dendrocalamus*, the inflorescence is composed of round congested globose heads. In both species, the spikelets are few-flowered and there are no lodicules. In *O. stocksii* and in *D. strictus*, the palea is keeled and ciliate on the keels and the paleas of the upper flowers are not keeled. The stamens have short-apiculate anthers and free filaments. Another important character is the vestiture of style and stigma. In both species, the style is sparsely ciliate and ends in a single feathery stigma. In *O. stocksii* and other species of the genus *Dendrocalamus* the basal nodes bear aerial roots.

*Oxytenanthera stocksii* can be easily separated from *Dendrocalamus strictus* by the distinct auricles and bristles in the culm sheath, comparatively large leaves (15–22 × 1.5–2.5 cm), slender spikelets, slightly apiculate anthers with short filaments, elongated ovary, and oblong caryopsis.

The above observations support the separation of *Oxytenanthera stocksii* from the genera *Oxytenanthera*, *Pseudoxytenanthera* and *Gigantochloa*, which justify its inclusion within the genus *Dendrocalamus*. Morphological characteristics of *D. stocksii* are compared with those of the type species of *Dendrocalamus*, *Oxytenanthera*, *Pseudoxytenanthera*, and *Gigantochloa* in Table 1.

While describing *Oxytenanthera stocksii*, Munro had also noticed its simi-

TABLE 1. Comparison of *Dendrocalamus stocksii* to *Dendrocalamus strictus*, *Oxytenanthera abyssinica*, *Pseudoxytenanthera monadelpha* and *Gigantochloa atter* (The type species of genera).

Characters	<i>D. strictus</i>	<i>D. stocksii</i>	<i>O. abyssinica</i>	<i>P. monadelpha</i>	<i>Gigantochloa atter</i>
Culm surface	matt, wax furry	glossy, wax thin	glossy, wax thin	glossy, wax thin	glossy, wax thin
Culm wall thickness	thick walled	thick walled	thick walled	moderately thick walled	moderately thick walled
Culm sheath auricle	small and rudimentary	well-developed with oral setae	small and rudimentary	well-developed with oral setae	well-developed with oral setae
Spikelets	2-3 flowered	2-3 flowered	1-3 flowered	1-3 flowered	3-4 flowered
Lemma	sparsely hairy	glabrous	sparsely hairy	glabrous	glabrous
Apex of anthers	slightly apiculate	slightly apiculate	perfectly apiculate	perfectly apiculate	perfectly apiculate
Filaments	free	free	United	united	united
Stigma	single	single	Three	three	single

larity to *Dendrocalamus strictus*. The type specimen of *O. stocksii*, housed at Kew (K), is annotated as *D. stocksii* Munro, and therefore it is evident that Munro had previously considered this species within *Dendrocalamus*. However, he treated the species within *Oxytenanthera* due to the presence of slightly apiculate anthers and striated membranous lower palea. The similarities between this species and *Dendrocalamus* were also mentioned by Gamble (1896) who pointed out that the narrow leaves, long petioles and culm sheath were similar to that of *D. strictus*. These similarities also led to the misidentification of this species by subsequent authors. All the previous studies including that of Munro and Gamble were merely based on herbarium specimens, and some of the field characters and floral characters such as the nature of filaments, ovary, palea etc., were omitted. Therefore, they did not observe the correct and distinct characteristics of the species. The field observation on the floral and vegetative characters confirm the present concept of the species and hence a new combination within *Dendrocalamus* is proposed.

This bamboo species, which is economically important, is widely cultivated throughout South India and is utilized for house construction, basket making, ladders, poles, and for several other purposes.

#### SYSTEMATIC TREATMENT

***Dendrocalamus stocksii*** (Munro) M. Kumar, Remesh & Unnikrishnan, comb. nov. *Oxytenanthera stocksii* Munro, Trans. Linn. Soc. London 26:130. 1868. *Pseudotenanthera stocksii* (Munro) R.B. Majumdar, Fl. Ind. Enumerat.-Monocot. 280. 1989. *Gigantochloa stocksii* (Munro) Nguyen, Bot. Zhurn. Akad. NAUK. 75:224.

1990. *Pseudoxytenanthera stocksii* (Munro) Naithani, J. Bombay Nat. Hist. Soc. 87:440. 1991. *Pseudoxytenanthera stocksii* (Munro) T.Q. Nguyen, Bot. Zhurn. NAUK 76:993, 1991. TYPE: INDIA. SOUTH INDIA. Concan: *Stocks s.n.* (LECTOTYPE, here selected: K).

*Vernacular names.*—Uyi, Mula (Malayalam), Konda (Karnataka).

*Distribution.*—Endemic to Northern Western Ghats. South India; northern Kerala and Karnataka along Concan coast, Goa, Maharashtra.

Selected Specimens: **INDIA. Kerala: Kasaragod Dist.:** North Kasargod, *Bamboo Products Exports 140317* (DD); Kanchangad, 29 Oct 1999 *Raveendran 20637* (KFRI). **Thrissur Dist.:** Palapilly, 16 Dec 2000 *M. Remesh 20646* (KFRI); 26 Feb 2001 *Unnikrishnan 74039* (CALI). **Goa: South Goa Dist.:** Noowary, 3 Mar 1985, *H.B. Naithani 1189* (DD). **Karnataka: North Kanara Dist.:** Coompta, 1884, *W.A. Talbot 269* (BSI); Flora of North Kanara *W.A. Talbot 549974* (CAL).

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#### REFERENCES

- BEDDOME, R.H. 1873. The flora sylvatica for southern India. *Madras* 3:232–233.  
 CAMUS, E.G. 1913. *Les Bambusees*. Lechevalier, Paris. Pp.149.  
 GAMBLE, J.S. 1896. The *Bambuseae* of British India. *Annals of the Royal Botanic Garden, Calcutta* 7:75–76.  
 HOLTUM, R.E. 1956. The classification of bamboos. *Phytomorphology* 6:73–90.  
 MUNRO, W. 1868. A monograph of *Bambuseae*. *Trans. Linn. Soc. London* 26:126–127.  
 MAJUMDAR, R.B. 1989. In: Karthikeyan, S. et al. *Flora Indicae*, ser. 4, 2 (Enumeratio Monocotyledonae). Botanical Survey of India, Howrah, Calcutta. Pp. 274–283.  
 NAITHANI, H.B. 1991. Nomenclature of Indian species of *Oxytenanthera* Munro. *J. Bombay Nat. Hist. Soc.* 87:439–440.  
 NGUYEN, T.Q. 1990. New taxa of bamboos (Poaceae, Bambusoideae) from Vietnam. *Bot. Zhurn. Akad. Nauk.* 75(2):221–225.